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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,862	08/28/2003	Der-Zheng Liu	TOP 312	6352
23995	7590	03/14/2008		
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005			EXAMINER BURD, KEVIN MICHAEL	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 03/14/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/649,862

**Applicant(s)**

LIU ET AL.

**Examiner**

Kevin M. Burd

**Art Unit**

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

1. This office action, in response to the remarks filed 12/12/2007, is a final office action.

### ***Response to Arguments***

2. Applicant's arguments filed 12/12/2007 have been fully considered but they are not persuasive. In the remarks, applicant states the text cited in the previous office action as the instant application's disclosed prior art is not an admission of prior art. In the non-final office action mailed 3/28/2007, the office action indicated figures 1A and 1B should be designated prior art. A rejection of the claims using the figure 1B and the text describing the transmitter of figure 1B was recited. Applicant did not indicate this citation was not prior art in the response received 6/28/2007. Applicant did amend the figures to include a Prior Art label for figures 1A and 1B. A new rejection of the claims under 103 using a different secondary reference, Figure 1B and the text describing figure 1B was recited in the office action mailed 9/12/07. Applicant is now raising an issue that the text describing figure 1B is not prior art.

Applicant states the information shown in figure 1B is admitted prior art (page 1 of the remarks filed 12/12/2007). The matrix shown in figure 1B is also prior art. Applicant now states the description of the variables shown in prior art figure 1B is not, in fact, prior art. The examiner disagrees that a transmitter comprising components containing variables that is admitted prior art would not contain a corresponding description of said variables in the body of the description and that description would

also be admitted prior art. Information detailing the operation of prior art drawings in an application is not routinely printed entirely on the drawing itself. The corresponding text is routinely found in the specification where one can refer back to the figure to understand the prior art embodiment. For this reason, the text found on page 4, lines 11-29 is prior art and the rejection of the claims is maintained. An objection to the amendment of the specification is stated below.

The examiner is making an Information Request under MPEP 704.11a regarding the prior art shown in figures 1A and 1B with prior art description of the corresponding prior art figures. The examiner requests applicant to provide a copy of the original prior art reference describing figures 1A and 1B. The original prior art reference will provide answers to what is prior art regarding figures 1A and 1B and what is an embodiment of applicant's present invention. It is believed the instant application's disclosed prior art of figure 1A is shown in JP 09-153882 figure 8 and the instant application's disclosed prior art of figure 1B is shown in JP 09-153882 figure 4. JP 09-153882 was published on 10/06/1997. JP 09-0153882 was provided in an IDS on 6/20/2007. JP 09-153882's figure 4 describes multiplier 43 generating two I signals generated from carrier wave frequency  $+W_n$  and negative carrier wave frequency  $-W_n$  (symmetrical with carrier wave frequency  $+W_n$  to the center frequency  $F_0$ ). Two Q signals will also be generated as well. Paragraphs 0056-0059 provide the corresponding description of figure 4.

For these reasons and the reasons provided in the previous office action, the rejections of the claims are maintained.

***Specification***

3. The amendment filed 12/12/2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the amendment to paragraphs on page 3, line 22 to page 4, line 29. The amendment was filed 12/12/2007.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over instant application's disclosed prior art (specifically figure 1B) in view of Tanaka (US 6,498,822).

Regarding claims 1-7, 16-22, the instant application's disclosed prior art discloses an apparatus for estimation of transmitter I/Q imbalance in a communication system in figure 1B. Signals are generated at a signal generator and input to MIX1 and MIX2. The signals are modulated in the mixers and transmitted. The parameters of the transmitter I/Q imbalance matrix can be estimated by transmitting two signals, each of which includes the power of the real and imaginary part in time domain, in two different

periods (page 4, lines 15-24). The two modulation paths are combined in adder ADD1. In the demodulation of each signal received by the receiver, two orthogonal carriers are used to respectively demodulate the real and imaginary parts of the time domain signals from the received signal (page 4, lines 15-24). The signals are transmitted at different periods and will each be demodulated by I and Q carriers in MIX3 and MIX4. The instant application's disclosed prior art does not specifically state the first and second signals are symmetrical in the frequency domain. However, the instant application's disclosed prior art does disclose the system is an OFDM communication system. Tanaka discloses an OFDM process that arranges data in a frequency domain. Column 1, lines 18-44, discloses the OFDM receiver. A center position of the frequency distribution of a multi-carrier transmission is detected for acquiring frequency synchronization with the receiving signal (column 1, lines 37-44). The multi-carriers are arranged symmetrically to a center frequency of the OFDM signal in the frequency domain. By acquiring frequency synchronization in the receiver, the received information can be processed and recovered quickly. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the OFDM teachings of Tanaka into the OFDM system of the instant application's disclosed prior art.

Regarding claims 8, 10-12, 14 and 15, the instant application's disclosed prior art discloses an apparatus for estimation of transmitter I/Q imbalance in a communication system in figure 1B. Signals are generated at a signal generator and input to MIX1 and MIX2. The signals are modulated in the mixers and transmitted. The parameters of the

transmitter I/Q imbalance matrix can be estimated by transmitting two signals, each of which includes the power of the real and imaginary part in time domain, in two different periods (page 4, lines 15-24). The two modulation paths are combined in adder ADD1. In the demodulation of each signal received by the receiver, two orthogonal carriers are used to respectively demodulate the real and imaginary parts of the time domain signals from the received signal (page 4, lines 15-24). The instant application's disclosed prior art does not specifically state the first and second signals are symmetrical in the frequency domain. However, the instant application's disclosed prior art does disclose the system is an OFDM communication system. Tanaka discloses an OFDM process that arranges data in a frequency domain. Column 1, lines 18-44, discloses the OFDM receiver. A center position of the frequency distribution of a multi-carrier transmission is detected for acquiring frequency synchronization with the receiving signal (column 1, lines 37-44). The multi-carriers are arranged symmetrically to a center frequency of the OFDM signal in the frequency domain. By acquiring frequency synchronization in the receiver, the received information can be processed and recovered quickly. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the OFDM teachings of Tanaka into the OFDM system of the instant application's disclosed prior art.

Regarding claim 9, the instant application discloses the signals are transmitted at different periods and will each be demodulated by I and Q carriers in MIX3 and MIX4.

Regarding claim 13, page 3, lines 26-30, discloses the estimation of the parameters is done before IFFT.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin M. Burd/  
Primary Examiner, Art Unit 2611  
3/5/2008